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TYLENCHORHYNCHUS SPECIES AS CROP DAMAGING PARASITIC NEMATODES

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INTRODUCTION: The stunt or stylet nematodes, as members of the genus *Tylenchorhynchus* Cobb, 1913 have come to be known (Fig. 1), are implicated in several plant disease associations. There are over 255 species of *Tylenchorhynchus* described worldwide. Many species have been found to parasitize numerous plant species of agronomic and horticultural importance and they are nearly ubiquitous in Florida fields and nurseries. They are well adapted to both tropical and temperate climates. As an example, it has been reported that the life-cycle of *T. claytoni* on tobacco is about one month at temperatures ranging from 30-34 C, while optimum reproduction occurred on wheat at soil temperatures of 21-27 C.

While many species are associated with plant damage, most of them are not considered aggressive parasites. Those species most consistently associated with crop plants are shown in Table 1. As is noted, generally these species are only mildly pathogenic and, while they may reproduce in great numbers on their host, little or no economic damage is associated with their pathogenic habits. Most damage reported occurred under glasshouse-greenhouse conditions.

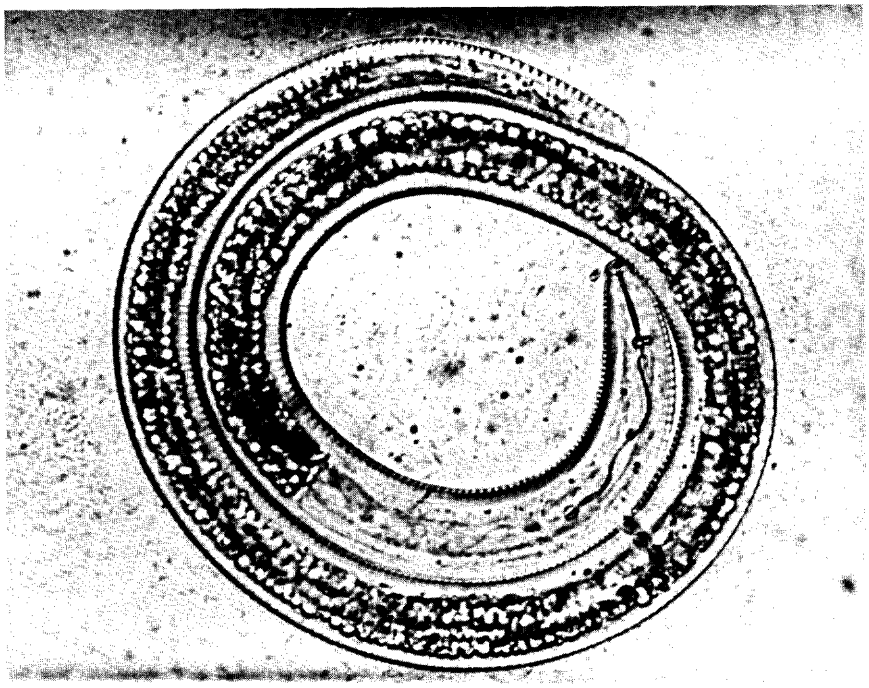

Fig. 1. A stylet nematode, *Tylenchorhynchus martini.*

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NEMATODE BEHAVIOR: *Tylenchorhynchus* species are primarily considered to be migratory ectoparasitic feeders, feeding along the root surface penetrating epidermal cells of roots and root hairs. Occasionally, they feed endoparasitically, confined to the outer cortical layers of the root. They have been reported to feed in large aggregations at the root tip, causing mechanical breakdown of epidermal, cortical and undifferentiated vascular tissue at this site. While this causes a reduction in main root growth, it is compensated for by increased lateral root growth.

SURVEY: In Florida, *Tylenchorhynchus* species are frequently found associated with other nematode plant parasites. Their widespread distribution, similarly, is due mostly to a diverse host range, their lack of specialization in their parasitism, and plant tolerance to infection.

Table 1. *Tylenchorhynchus* spp. and plant associations. Information concerning nematode-host response is found in the references cited at the end of this circular.

Species[1]	Host	Remarks
*T. agri**	*Zea mays*	Sweet corn - a good host, nematode a mild pathogen.
*T. acutus**	*Saccharum officinarum*	No growth suppression demonstrated.
T. brevilineatus		
T. aduncus	*Vitis* sp., *Daucus carota*, *Allium cepa*, *Pisum sativum*, *Solanum tuberosum*	Mild pathogen.
*T. brassicae**	*Brassica oleracea*	No plant damage
*T. capitatus**	*Nicotiana tabacum*	No plant damage
*T. clarus**	*Zea mays*	Mild pathogen.
	Glycine max	Soybean yields increased with nematicide treatment.
*T. claytoni**	*Nicotiana tabacum*	Mild pathogen, no effect on
	Glycine max, Zea mays,	yields.
	Cereals, Grasses	Good hosts, mild pathogen.
	Rhododendron sp.	Growth suppression under greenhouse conditions.
	Pinus elliottii	Seedling growth suppression.
T. cylindricus	*Gossypium hirsutum*	Association - mild pathogen.
*T. latus**		
T. dubius[2]**	*Brassica oleracea*	Association - mild pathogen.
	Agrostis palustris	Suppressed plant growth, mild pathogen.
	Poa pratensis[3]	Severe suppression in plant growth.
	Vicia faba	Severe damage in greenhouse experiment.
*T. eremicolus**	*Triticum aestivum*	Economic plant response from nematicides in India.
T. brevidens = *Merlinius brevidens*		Suppresses plant growth, mild pathogen.

T. ewingi[*]	*Pinus* sp.	Association - mild pathogen.
T. martini[**]	*Oryza sativa*[4] *Saccharum officinarum*	Good host, mild pathogen.
T. annulatus *T. elegans* *T. indicus* *T. dactylurus* *T. curvus* *T. crassicaudatus* *T. palustris*		Other species found in association with rice culture.
T. maximus	*Zea mays*	Association - mild pathogen.
T. lamelliforme	*Poa pratensis*	Yield suppression.
T. nudus[*]	*Zea mays* *S. officinarum*	Association - mild pathogen.
T. robustus	*Lolium perenne* Western wheatgrass	Mild pathogen. Suppressed growth in greenhouse experiments.
T. vulgaris	*Zea mays*	Mild pathogen.

[1]This list is not complete; however, it covers most species found in the literature in association with plants.
[2]Reported to be associated with approximately 30 different horticultural and agronomic crops in Europe.
[3]Dominant parasite.
[4]May cause yield suppression in deepwater rice in Bangladesh.
[*]Occurs in Florida.
[**]Most common stylet or stunt nematode found in Florida.

Fig. 2. Damage caused by *Tylenchorhynchus claytoni* to pine, *Pinus elliottii* seedlings on left compared to healthy seedlings of the same age on right.

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